

Software Specifications

SYSTEM MESSAGE VIEWER

Checkout and Launch Control System (CLCS)

84K00540-070

Approval:

Date

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NOTE: See "**Supporting Document Note**" on following page

PREPARED BY: Carmen Wolford-Natschke

5/13/98

Updated to standard format (cam)

Supporting Document Note: Acronyms and definitions of many common CLCS terms may be found in the following documents: CLCS Acronyms 84K00240 and CLCS Project Glossary 84K00250.

REVISION HISTORY

REV	DESCRIPTION	DATE

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1. SYSTEM MESSAGE VIEWER

1.1 SYSTEM MESSAGE VIEWER OVERVIEW

The System Message Viewer CSC provides a Graphic User Interface (GUI) for accessing and displaying message information gathered and managed by the System Message Service CSC of the System Services CSCI. The System Message Viewer CSC is resident on the CCW/S as outlined below.

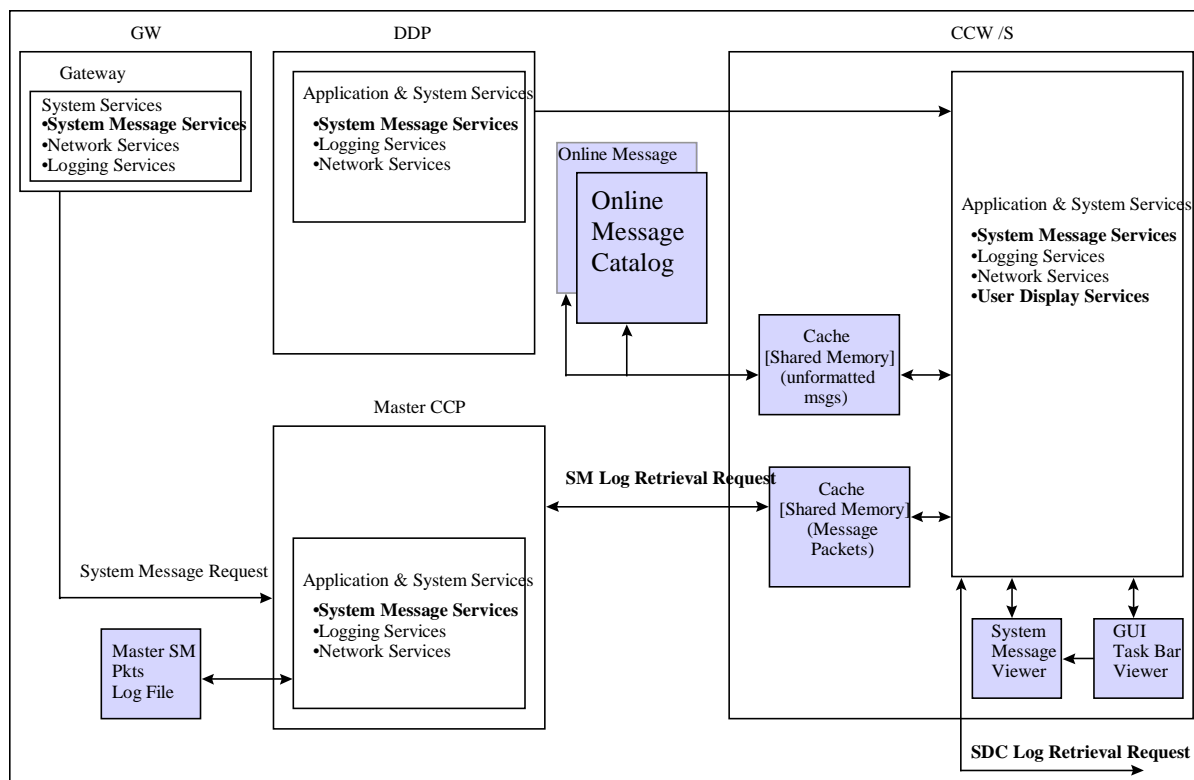


Figure 1. RTPS Systems Overview of SMV

1.1.2 SYSTEM MESSAGE VIEWER OPERATIONAL DESCRIPTION

SM Viewer provides a graphical display interface which allows the end user to: create a subscription, delete a subscription, acknowledge/ silence alarms, inhibit/hide, unhide/uninhibit, print, and view on-line help for system messages.

1.2 SYSTEM MESSAGE VIEWER SPECIFICATIONS

1.2.1 SYSTEM MESSAGE VIEWER GROUND RULES

- The SMV will receive system messages (with the inserts already filled in) in a defined format.
- SMS will provide the ability to retrieve up to the last 1000 message packets.
- System Messages will not contain more than 5 lines of text.
- GUI Task Bar(DNAV) is responsible for invocation of System Message Viewer.
- The GUI Task Bar will provide the capability to start multiple System Message Viewers.
- Insert help available only if details exists otherwise mouse pointer will not change shapes.
- OPS CM will provide the mechanism to access the SCT for retrieval of subsystem names.
- Inhibit has precedence over Subscription.

1.2.2 SYSTEM MESSAGE VIEWER FUNCTIONAL REQUIREMENTS

System Message Viewer Definitions

- Subscription Ability to subscribe to a group of messages based on certain criteria
 - Subscribe Allow messages to be displayed based on certain criteria (e.g., platform, severity, CSC, etc.)
 - Hide Temporarily remove selected message(s) from the list.
 - Inhibit Automatically filter all future occurrences of a particular message
1. SM Viewer shall display system messages graphically, *by group* and time sequence, in a scrollable list provided by the System Message Viewer.
 2. SM Viewer shall provide a summary that contains total message count by *group*, severity, and of messages that have been acknowledged by the user for each level of severity.
 3. SM Viewer shall display the System Message number and text as well as the following:
 - a) Severity
 - b) CSC
 - c) RSYS
 - d) Time Stamp
 4. The SM Viewer shall be able to receive system messages by specifying *one or more groups*.
 5. SM Viewer will provide a mechanism to create a subscription(subscribe).
 6. SM Viewer will provide a mechanism to delete a subscription(unsubscribe).
 7. *SM Viewer shall be able to separate system messages by group.*

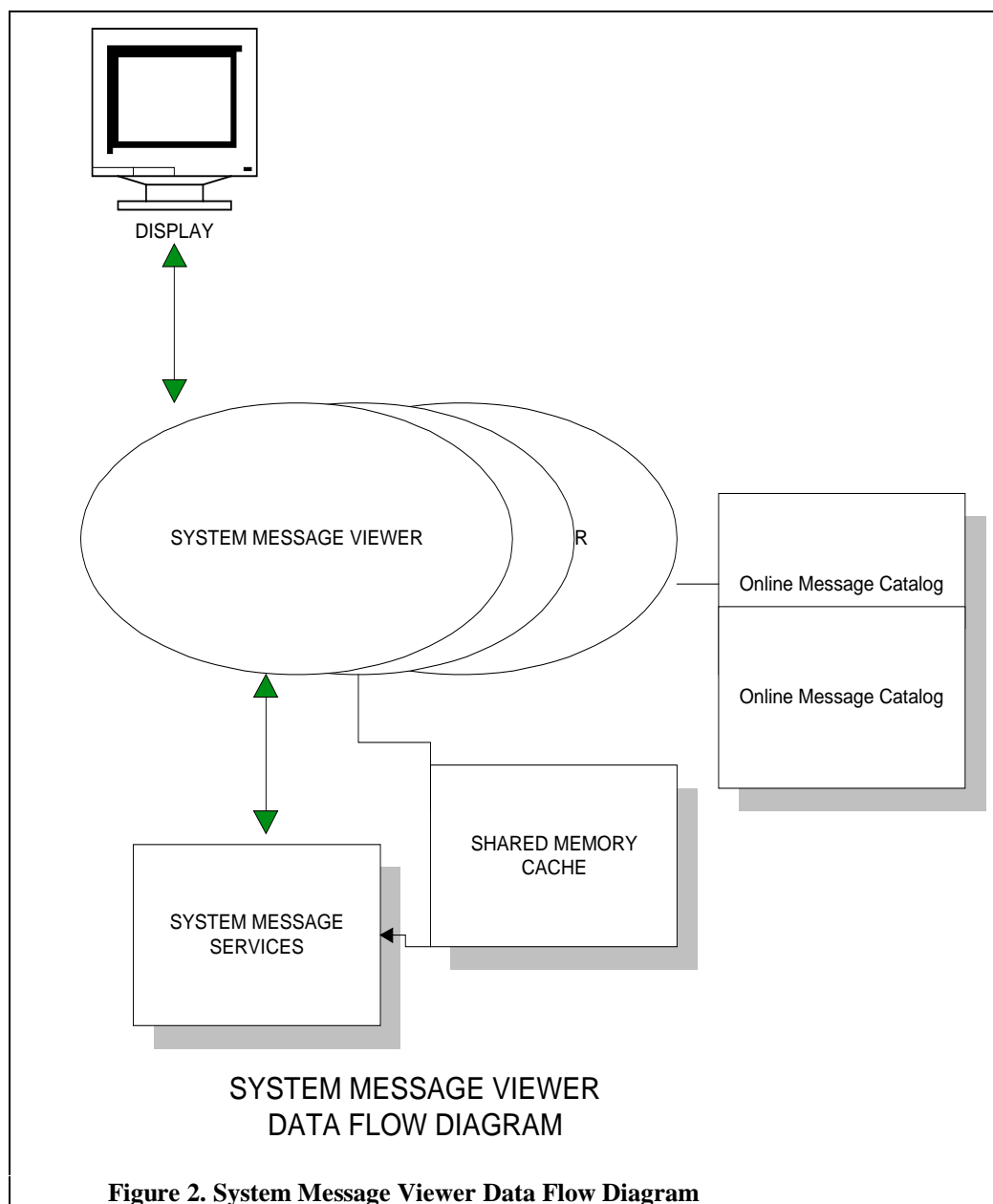
8. SMV uses subsystem names from the SCT when needed to display a name for a subsystem.
9. SM Viewer shall keep a total of 1000 of the last system messages viewable to the SM Viewer, this is independent of *number of groups*.
10. *The total number of messages returned to the display as a result of a subscription is dependent on the following factors:*
 - a) *Up to the 1000 most recent messages prior to subscription filtering will be returned and displayed.*
 - b) *There exists 3 conditions when less than a 1000 messages will be returned.*
 - i) *If the filtering results in less than 1000 messages being returned, then only the number of returned messages will be displayed.*
 - ii) *If there already “n” messages displayed, then the (1000-n) messages will be displayed.*
 - iii) *If there is less than 1000 messages in the log file*
 - c) *If subscription filtering results in the return of no messages, then SMV will display an informational message stating that no messages were found.*
11. A mechanism will be provided to allow users to assign a name to their subscription groups. The name will consist of the subscription criteria.
12. *A mechanism will be provided for expanding and collapsing subscription summaries and their associated messages.*
13. The SM Viewer shall provide the following filters:
 - a) Hide - will hide message(s) from the display- pertains to entire scope of viewer.
 - b) Inhibit - will filter future occurrence of a message(s) - pertains to entire scope of viewer.
14. SM Viewer shall provide a mechanism to unhide or uninhibit hidden or inhibited messages.
15. SM Viewer shall provide a mechanism to select Help(Message Number), CSC and *Insert Detail* information for each system message. This information shall not be visible until requested by the user.
16. SM Viewer shall be able to acknowledge messages individually, by *group* and all.
17. SM Viewer shall be able to silence messages individually, by *group* and all, this will occur independent of message acknowledgment.
18. Help(Message Number), CSC and *Insert Detail* retrieval will occur when the right mouse button is clicked on any of the above mentioned fields.
19. Mouse pointer shape will change from an arrow to another form when mouse is dragged across a valid(help text exists) Help(Message Number), CSC or *Insert Detail* field.
20. SM Viewer will provide a mechanism to allow an audible ~~-and~~ visual (message bolded) alarm notification to be activated in conjunction with the system message
21. SM Viewer shall provide for single and *multiple-line* message display capability.
22. SM Viewer shall provide the capability to resize the SM Viewer using mouse.
23. The SM Viewer shall be able to print system messages.
24. SM Viewer will support a minimum of three message severity level classifications.
25. Each message severity classification will have a unique color.
26. SM Viewer will support a maximum line length of 255 characters.
27. SM Viewer will provide the user the capability to display the time stamp of system messages(applies to all messages) in various formats.

- a) Can be displayed as :ddd:hhmm/ss.sss.
 - b) Can be displayed as : hhmm/ss.
- 28. SMV will provide the capability to sort on individual fields (e.g. Time Stamp, RSYS, CSC, Severity ,Message Number, and Message Description).This is a level one sort for Thor. *Post Thor multi-level sorts will be supported.*
 - 29. *Upon initial invocation, the System Message Viewer will examine the User Preferences file to establish the initial subscription.*
 - 30. (THOR-only) Upon initial SMV invocation the subscription window will be displayed for user to select subscription criteria -*Post Thor subscription information will be pulled from User Preference File.*
 - 31. *SMS will provide an interface for retrieving system messages from the SDC to the SM Viewer.*
 - 32. *SMV shall allow users to specify in their subscriptions a start time and optionally an end time for use in retrieving previously recorded messages.*
 - 33. *SMV, when the viewer window is minimized, will provide a notification mechanism to the user when a new system message has been received.*
 - 34. *SMV will also be capable of running in the BASIS environment. SMV will be limited to only one viewer in the BASIS environment.*
 - 35. *SMV will provide the capability to search active system messages for a user specified text string.*

1.2.3 SYSTEM MESSAGE VIEWER PERFORMANCE REQUIREMENTS

The display of the first message retrieved as a result of a subscription should take no more than 2 seconds. If there are no messages retrieved a pop up window will be displayed to the user stating that no messages were found , this should also occur in no more than 5 seconds.

1.2.4 SYSTEM MESSAGE VIEWER INTERFACES DATA FLOW DIAGRAM



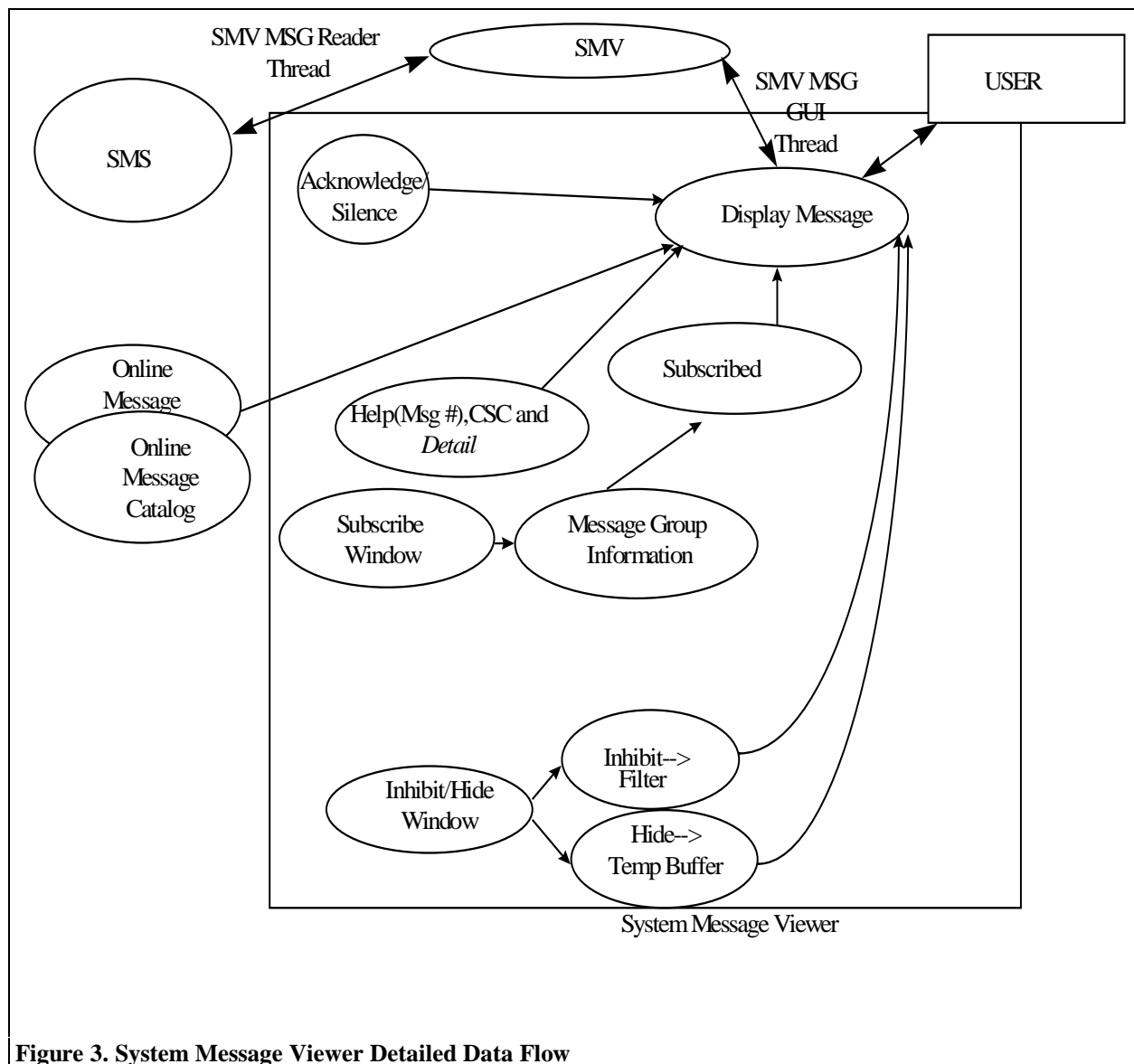
System Message Viewer(SMV) listens(SMV reads thread) and retrieves messages from the shared memory or Online Message Catalog through APIs provide by System Message Services (SMS). SMV GUI thread displays the messages in a scrolled window on the CCW/S. SMS will provide

system messages with inserts filled in and in a predefined format, SMV will then display the messages on the user display.

1.3 SYSTEM MESSAGE VIEWER DESIGN SPECIFICATION

The first SMV that is invoked will determine if the shared memory segment is present, if it is not then the SMV will launch the SMS CCW/S thread. SMS CCW/S Thread is responsible for reading all incoming messages and writing them to the shared memory segment. Once the SMS CCW/S thread is active it retrieves up to the previous 1000 messages from the SM Master Log File and places them into the shared memory segment. If SMV can not find the message in the memory cache then SMV will look in the online message catalog to retrieve the message packets and send them to the SMV GUI thread. The SMV GUI thread is responsible for writing the formatted messages to the SMV display.

1.3.1 SYSTEM MESSAGE VIEWER DETAILED DATA FLOW



1.3.2 SYSTEM MESSAGE VIEWER EXTERNAL INTERFACES

TBD

1.3.2.1 SYSTEM MESSAGE VIEWER MESSAGE FORMATS

A “connection complete” message is displayed on the SMV when connection to SMS is established. This message is not sent over the network as a system message. Instead, it is generated internally

and assigned a message number of 0, a severity of information , text saying “connect request accepted”, and a CSC of SMV.

1.3.2.2 SYSTEM MESSAGE VIEWER DISPLAY FORMATS

The System Message Viewer is invoked via the GUI Task Bar (DNAV).

SMV GUI -Main Window Error! Not a valid link.

Figure 4. Main Window of System Message Viewer

Main Window Functions

1. Display the message at the appropriate location listed by group in a scrolled window.
2. Messages will be listed by time stamp.
3. Create Subscription and Delete Subscription mechanisms will be provided.
4. *Subscription summaries and their associated messages will be displayed in an expandable/collapsible format.*
5. *Provide a display for the updated summary status information for the group.*
6. The Message Display will output an audible alarm where required by message severity.
7. The Message Display will allow the user to view messages and perform actions on them. Users can scroll through messages, inhibit/hide and uninhibit/unhide different message levels, acknowledge messages (changes message to gray background, message text color will be related to the message’s severity level and silences alarm.-As depicted in the following matrix :)

	PREACKNOWLEDGEMENT		POST ACKNOWLEDGMENT	
	Foreground	Background	Foreground	Background
Information	Black	Cyan	Cyan	Gray
Warning	Black	Yellow	Yellow	Gray
Error	Black	Red	Red	Gray

9 Retrieve help for Message Number, CSC and *Detail information* from the message index file if requested by the user.

Creation of a Subscription

Once the SMV has been launched, the user can choose the Subscription option by activating the Subscription button. This will allow the user to :

- a. Subscribe to all messages
- b. *Subscribe to certain messages that meet one or more of the following criteria RSYS, Subsystem, Message Type, Severity Level or the user can choose a specific message by entering the Message Number.*

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Figure 4. SMV Subscription Screen

If the SMV is subscribed to one or more message groups ,the message will be added to the portion of the SMV display for that message group. SMV filtering for subscriptions will only use the relational AND, this function will be implicit to the system and will not be part of the user interface.

Inhibit/Hide Specific Messages

SMV will allow message(s) to be hidden or inhibited via the Hide/Inhibit task menu bar activated with a right mouse click, which when activated will launch a pop up window offering the user to either hide or inhibit a specific message number. The Hide function will place all of the messages associated

with a specific message number currently on the display into a temporary buffer area. The message(s) will be available for retrieval at a later time by utilizing the Unhide function (as long as the SMV is still active). The Inhibit function will filter all future occurrences of all the messages associated with a specific message number. The message(s) may be uninhibited at a later time(as long as the SMV is still active),via the Uninhibit function .

Subscription Summary Information

*There will be a **summary status line** for each subscription. The summary status line contains the group name(which is obtained from the subscription criteria) count information for each severity level, and count information for all messages. The count information consists of the total number of messages received, and the total number of messages acknowledged.*

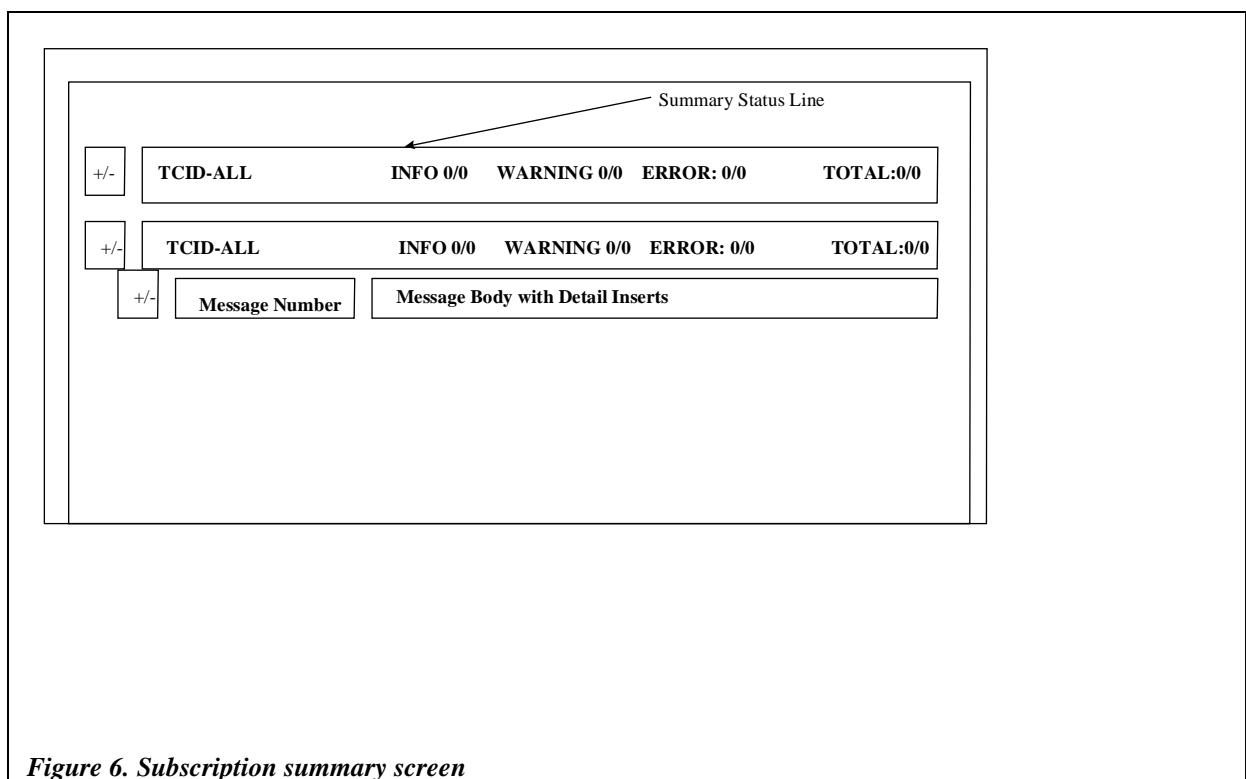


Figure 6. Subscription summary screen

The summary status line can be expanded to show the messages and collapsed to hide the messages, via a push button to the left of the line. The push button label indicates if there is data hidden: a “+” indicates the line can be expanded to show more data; a “-” indicates that the line can not be expanded. When a summary status line is expanded, the first line of each message received or the group is displayed. These lines will also have expand/collapse push buttons.

Deletion of Subscriptions

SMV will allow deletions of the currently active subscriptions available on the display. The user will be presented with a list of current subscriptions from which he can delete one subscription at a time.

Uninhibit/Unhide

SMV will allow specific messages to be unhidden or uninhibited via the Unhide/Uninhibit button on the task menu bar which is to be activated via a right mouse button click, which when activated will launch a pop up window offering the user to either unhide all messages or uninhibit a specific message number. Unhide will result in all messages being shown. Uninhibit will result in a user specified message to be uninhibited.

Message Acknowledgment and Silencing of Alarms

SMV will allow users to [acknowledge and or silence messages using any of the following methods](#):

1. Acknowledge a single, *group* or all message(s) with a right mouse button click on the message body-the user will be presented with a pop up menu next to the message.
2. Silence a single, *group* or all message(s) with a right mouse button click on the message body-the user will be presented with a pop up menu next to the message.

On-line Help Retrieval

Obtaining on-line help for Message Number, CSC or *Insert Detail* will occur with a single right mouse click over the specific field. The mouse pointer shape will change from an arrow to another form when the mouse is dragged across a valid(help text exists) Message Number, CSC or *Insert Detail* field.

1.3.2.3 SYSTEM MESSAGE VIEWER INPUT FORMATS

See section 1.3.2.6.

1.3.2.4 SYSTEM MESSAGE VIEWER RECORDED DATA

Not applicable.

1.3.2.5 SYSTEM MESSAGE VIEWER PRINTER FORMATS

SMV shall provide print capability for printing of system messages.

1.3.2.6 SYSTEM MESSAGE VIEWER INTER-PROCESS COMMUNICATIONS

The System Message Viewer receives data only from SMS. This data will be received through a reader thread accessing a shared structure between SMV and SMS. The shared structure will contain

the message with inserts as well as any other parameters SMV will require to display the message.

The contents of this structure are :

Message #, Responsible System, CSC, Reference Designator, Julian time of year, Millisecond time of day, Source application ID, Message severity level, Alarm (boolean), subsystem and the message text (Size 256bytes).

1.3.2.7 SYSTEM MESSAGE VIEWER EXTERNAL INTERFACE CALLS

The System Message Viewer will not provide any APIs. It will call the following APIs:

```
sms_format_message
sms_get_message
sms_get_message_help
sms_get_message_csc_details
sms_get_message_packet_from_stream
sms_get_message_insert_from_database
```

1.3.2.8 SYSTEM MESSAGE VIEWER TABLE FORMATS

SMV will utilize a structure to maintain buffered messages -those that are hidden. A pictorial representation of the table is illustrated below:

Time Stamp	Severity	RSYS	Subsystem	CSC	Message #	Description

The maximum size of each message is 256 bytes.

This is to be a variable size structure.

1.3.3 SYSTEM MESSAGE VIEWER TEST PLAN

The System Message Viewer development team will build a test driver tool that will send message structures through the pipe to SMV for Unit Test.

System Message Viewer system level tests may be run in either the IDE or SDE, or both. These tests are run on the CCW/S platform, with SMS supplying the messages. An SMS test tool will be required to generate messages originating from any platform.

The specific test cases that will be run include:

1. Receiving messages *from various message groups and sub-groups* to verify that they are placed in the proper area in the SMV Main Window.
2. Acknowledging messages to verify that associated alarms are silenced.
3. Verify that message counts are kept correctly.

4. *Verify that the summary status lines may be “expanded” to make the messages associated with that group visible, and then “collapsed” to make the messages invisible.*
5. Verify that Help and CSC help text is retrieved.
6. Verify that the inhibit function filters all future occurrences of specified messages.
7. Verify that the hide function makes invisible currently displayed message specified by user.
8. *Verify that messages belonging to different subscriptions are acknowledge “simultaneously”.*
9. Verify that user specified time stamp format works correctly.
10. Verify correctness of returned messages based on subscription criteria.
11. Verify SMV printing capability.
12. *Verify mouse pointer shape change over context-sensitive help area.*
13. Verify the creation and deletion of subscriptions
14. Verify message text associated with severity levels.